Journal of Forensic and Legal Medicine 28 (2014) 47–49

Contents lists available at ScienceDirect

Journal of Forensic and Legal Medicine

journal homepage: www.elsevier.com/locate/jflm

Letter to the Editor

A response to: Macroscopically detected female genital injury after consensual and non-consensual vaginal penetration: A prospective comparison study [20 (2013) 884–901]

Sir,

The article by Lincoln et al.[1] published in October 2013 "Macroscopically detected female genital injury after consensual and non-consensual vaginal penetration: a prospective comparison study" raises important issues regarding the significance of the presence or absence of genital injury in cases of alleged sexual assault. This article is one of only two papers in the literature that compares genital injury rate between a 'consenting' and a 'non-consenting' group, using only macroscopic examination. The other paper was by McLean et al.[2] Lincoln et al. must be congratulated on completing a study on a difficult topic. The paper is well written and easy to understand. Despite a robust methodological approach by the authors, there were the inevitable challenges including challenges to minimizing recruitment bias, defining and identifying injury types, and the standardization of interpretation of injuries amongst the group of examining clinicians. It is noteworthy that the study took 6 years to complete – a reflection of these difficulties, as well as, resource and time constraints.

The paper is straight forward and easy to follow. The study uses a prospective design (instead of retrospective chart reviews) which is a key strength, and women were recruited at the time they presented for a genital examination. Other features of the study design to try to address the need for reliable comparative information about genital injury were:

a) Examiners were experienced in both normal and abnormal genital examinations, and forensic examinations
b) No post-menopausal women or women younger than 18 years were included.
c) All examinations were performed within 72 h of a single episode of vaginal penetrative sexual contact. Anybody with more than 1 episode of some form of vaginal penetration within that 72 h period was excluded
d) There was a clearly defined examination protocol using macroscopic examination only, without the use of colposcopy or staining
e) A standardized pathological injury definition was used. Findings recorded included only bruises, abrasions and lacerations. No redness, swelling, or anal findings were included. The doctors involved in both groups had primary care, women's health/sexual health and forensic experience and all were (or had been) on sexual assault rosters. It is good to see that the paper states the doctors were familiar with distinguishing injury from infective/inflammatory genital conditions as this is an important consideration which is absent from most other studies in this area. The study was not able to be blinded, so doctors knew which patients they were examining. The author states that being trained forensic examiners, it is hoped they were able to be impartial and objective.

The paper's conclusion states that "genital injury was significantly more likely to occur with non-consensual then consensual penetration". The overall findings from the study were that the 'non-consenting' group had a high injury rate of 53.7% (22/41) and were "20 times more likely" to sustain injury than the 'consenting' (9.9%, 8/81) group. This is a high injury rate for the non-consenting group, compared to other studies in the literature. There are several possible explanations for this high rate of injury, including small sample size in both groups, possible recruitment bias and difference in timing of the examination between the two groups. Our concerns about the study are outlined below:

1. The most important point was a conclusion from this paper that "the 'non-consenting' group had a high injury rate and were 20 times more likely to sustain injury than the 'consenting group'." We are concerned that the authors of the paper have caused confusion by describing the "odds ratio" of 19.5 as a "relative risk". It is more correct to talk about a factor of approximately 5, i.e. in the non- consensual group, the risk of genital injury was approximately 5 times the risk of genital injury in the consensual group.
2. Sample size. As the authors state in the discussion, the major limitation of this study was the small sample size. The overall numbers in the study are low. In this 6 year period, the study managed to recruit 81 women to the consenting group and 41 women to the non-consenting group. The required sample size for detecting a difference between the 2 groups was 57 for each group. So while it was possible to make an overall conclusion, by virtue of reference to the existing data in the literature, this must be interpreted with caution. In order to do further sub-analysis of the data (i.e. injury pattern analysis), the numbers required were at least 100 in each group. The study was not able to recruit the required minimal number of 100 women in each group, so discussions about secondary analysis must also be interpreted with caution.
3. Possible recruitment bias within the non-consenting group. Of the 147 sexual assault patients who were seen, 28% (41) were

http://dx.doi.org/10.1016/j.jflm.2014.08.011

recruited. Of the remainder who were not recruited; 40% were outside the age range or had pigmented skin, 24% had experienced recent consenting sexual contact, 8% had no memory of the event and 8% were not considered competent to consent to the study.

The women in the 'non-consenting' group were recruited in a way that has potential for significant selection bias. The author states "Discussion about the study took place after the genital examination to avoid increasing anxiety about the examination. If there was any question of whether vaginal penetration had occurred or not, the woman was not recruited to the study, unless she described genital symptoms reliably consistent with recent sex and/or had sustained genital injuries suggestive of recent vaginal penetration". The involvement of alcohol and/or drugs is frequently encountered in cases of reported sexual assault, and can have an impact on a person's memory. Recruitment to the study is problematic because of a dilemma of whether to include this group or not, as there is considerable potential to affect the outcome. It appears that the authors have tried to include only cases with a clear history of penetration and exclude those women who were unable to give a clear history of what happened in order to reduce the possibility of including cases where 'nothing happened'. This aspect of the recruitment is important and requires more explanation than is currently provided within the paper. It would be very important to ask the authors to clarify the following issues:

a) Firstly, it is not explained what exactly are '*genital symptoms reliably consistent with recent sex*'?
b) Secondly, women were recruited "*if they had sustained genital injuries suggestive of recent vaginal penetration*".
c) Thirdly, has the study inadvertently targeted women who are more likely to have an injury? Or alternatively has the study methodology inadvertently excluded a group within the cohort who were less likely to have genital injury. Excluding 8% of women who could not consent to the study and 8% who had no memory means 16% of women have been excluded who may well have experienced penetration. If the authors had included all cases of alleged sexual assault (even if there was no clear memory of vaginal penetration), this would have therefore likely resulted in a lower rate of genital injury.

4. Symptoms. 39% (16/41) of the 'non-consenting' group compared to 16% (13/81) of the 'consenting' group were symptomatic with genital pain, bleeding, or dysuria at time of examination. This would seem to be a high rate of symptoms in the 'non-consenting' group and may reflect possible selection bias (more likely to agree to participate) and thus contribute to the higher rate of findings found on examination. It is also possible that presence of symptoms is a factor influencing the likelihood of reporting and or having a genital exam, following an alleged sexual assault.
5. Pre-existing Infection. The authors made some effort to account for pre-existing infection but there are no figures for how many women had clinical vulvitis on their examination (as "redness" is one of the findings that was excluded as a descriptive term).
6. Timing of examination. The timing of the examination is quite different between the groups. 90% of the 'non-consenting' group were examined within 24 h of vaginal penetration compared to only 28% of the consenting group. The majority of the 'consenting' group were examined from 24 to 72 h. This is an important difference which will contribute to the 'non-consenting' group having a higher rate of findings.
7. Injury definitions. The authors have tried to ensure examination findings and definitions are standardized. They have correctly excluded redness and swelling, from any injury definition and allowed for the presence of possible infection as an influencing factor. However, skin splits (vulval fissures) in the genital area are a common finding and it can be extremely difficult, often impossible, to differentiate a split resulting from trauma (laceration or abrasion) and one resulting from a skin condition or infection. Unfortunately, the study does not state how non-specific skin splits (vulval fissures) were documented or categorized and it appears that all "breaches" in the genital area were categorized as either a laceration or an abrasion.
8. Secondary analysis. The paper also considered whether there was a difference in the type of injury that is sustained between consenting versus non-consenting sex i.e. can the site of injury, number of sites, type or pattern of injury be used to assist in assessing presence or absence of 'consent'? This paper is not able to answer these questions, as the numbers in the study are too small to go into any meaningful breakdown of the results. The subsequent lengthy discussion and sub-analysis on injury 'typology' and 'patterns', therefore needs to be read with caution, as indeed the authors have pointed out. The author does state these findings "warrant further investigation" and that "macroscopic genital examination may be uniquely placed to detect consent group differences in injury typology and pattern, if they exist". However, it is a concern that such lengthy discussion on findings that are not statistically significant could be misleading to a reader less skilled at critical appraisal, who may interpret that examination findings will assist in differentiating 'consenting' from 'non-consenting' sexual contact.

It is interesting to compare Lincoln et al.'s work with that of McLean et al., which differs in several aspects. McLean et al.'s study 2011 in the UK is the only other study comparing injury in consenting and non-consenting contact, using macroscopic examination only. However 30% of that group were post-menopausal women. It was partly a prospective study where the volunteers were recruited by sending out flyers, but the data for the non-consenting group was from a retrospective chart review. There were 500 women in the non-consenting group (chart review) and 68 women in the consenting group and all were examined within 48 h of the alleged event. The injury rate was 23% in the non-consenting group and 6% in the consenting group. Again this study suffers from the problems of recruitment and selection bias.

There are now two papers in the literature that state that non-consenting sexual intercourse has a higher rate of injury than consenting sexual contact – McLean et al. by a factor of 4, and Lincoln et al. "by a factor of 20". The difficulty now lies in translating this information for use in the legal arena. There is a danger that over-simplification will leave a lay person with the false impression that the complainant before them with an injury is "20 times" more likely to have had non-consenting contact (been "raped") than consenting contact. Equally, the absence of injury may be interpreted as indicating that the contact is "20 times" more likely to have been consensual.

Many people assume that any non-consenting sexual contact involving penetration will result in damage to the genital area which the doctor will be able to see. However, this is not necessarily the case. Both consenting and non-consenting sexual contact may or may not result in injury.

Merely agreeing or not agreeing to a sexual act is an oversimplification of the likelihood of sustaining injury. It is also important to understand the limits of medical evidence. The question of consent still remains an issue for the jury, not the medical expert. There is and remains, no medical literature or research to reliably answer this question.

With regard to the literature that compares consenting sexual intercourse with non-consenting intercourse, the literature to date is very limited and does not support any particular injury, pattern of injury, or finding that can distinguish consent from non-consent. Injury can occur in either group and the literature does not help clarify the matter further.

It is normal and common for penetration to occur without causing injury and the majority of people seen after an alleged sexual assault have a normal genital examination.

During penetration, injuries may occur but are usually minor, for example small bruises, small lacerations and abrasions. Minor genital injuries heal quickly, often within hours or days.

The likelihood and extent of genital injury following penetration is affected by many factors. These include the age of the person, their general health and medications, whether there is any skin condition, disease or inflammation, presence of lubrication, the stretchiness of the orifice, the degree of force involved and the nature of the penetrating object (e.g. penis, finger or another object).

The time frame between the alleged event and the medical examination may affect the likelihood of seeing injuries.

The current consensus is that 20–30% of sexual assault complainants have injury when examined acutely. This is based on the existing body of literature and current medical expert consensus opinion of those working in this field in the UK, USA and Australasia. There are a variety of explanations for this. In other words, if an examination is normal, the possibilities are that:

a) no sexual contact occurred
b) sexual contact was of a nature that did not include penetration
c) penetration did occur without causing injury
d) there may have been minor injuries sustained which have healed by the time of the examination.

Lastly, the article by Lincoln et al. raises an important issue that is absent in most other publications of this type. That is the significance of skin findings in the genital area can be difficult to assess because minor skin changes can be found reasonably often, with no assault having been alleged or even sexual contact having occurred. Non injury related genital pathology should be included in future studies and more effort made to raise the awareness of clinicians to take care with their interpretation of findings in the genital area.

This paper sets a new standard for future research into this area. We look forward to a response from the authors.

References

1. Lincoln C, Perera R, Jacobs I, Ward A. Macroscopically detected female genital injury after consensual and non-consensual vaginal penetration: a prospective comparison study. *J Forensic Leg Med* 2013;**20**:884–901.
2. McLean I, Roberts SA, White C, Paul S. Female genital injuries resulting from consensual and non-consensual vaginal intercourse. *Forensic Sci Int* 2011;**204**:27–33.

Min Karen Lo*, Christine Foley
Auckland Sexual Health Service, Auckland, New Zealand

Pohutukawa Adult Sexual Assault Service, Greenlane Clinical Centre, Auckland, New Zealand

DSAC (Doctors for Sexual Abuse Care), Auckland, New Zealand

Clare Healy
Cambridge Clinic, Christchurch, New Zealand

DSAC (Doctors for Sexual Abuse Care), New Zealand

Jeannie Oliphant
Auckland Sexual Health Service, New Zealand

Pohutukawa Adult Sexual Assault Service, Greenlane Clinical Centre, Auckland, New Zealand

DSAC (Doctors for Sexual Abuse Care), New Zealand

Susanna Kent
Sexual Assault and Treatment Service, Wellington, New Zealand

DSAC (Doctors for Sexual Abuse Care), New Zealand

* Corresponding author.
E-mail address: minl@adhb.govt.nz (M.K. Lo).

4 May 2014
Available online 20 August 2014